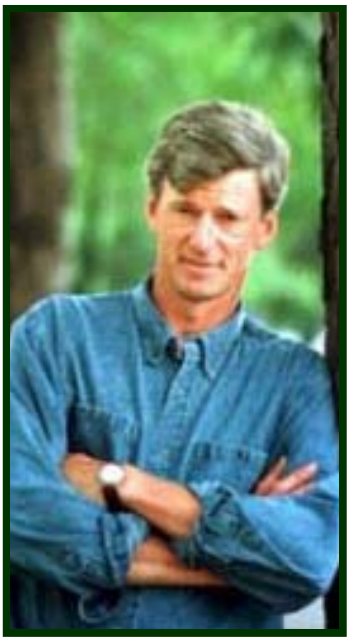
Massachusetts Wetlands Restoration

GROWetlands Site Profiles

Massachusetts Wetlands Restoration Program
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

August 2002

Jane M. Swift, Governor
Bob Durand, Secretary
Christy Foote-Smith, Director



August 2002

Dear Friend of Wetlands:

Massachusetts has lost more than 28% of our wetlands since the colonial times, while much of the remaining 600,000 acres has been degraded by human activities. While we continue to hold the line on further wetlands losses through strong permit programs, we are also working to address historic wetland losses and degradation.

Wetlands restoration is the keystone of our strategy to implement the Commonwealth's policy of "no net loss of wetlands in the short term, and a net gain in the long term." Since 1994, the national award-winning Massachusetts Wetlands Restoration Program (MWRP) has been working to restore our wetland heritage. Restored wetlands provide essential habitat for a diversity of fish, wildlife, and plant species. They also provide important flood storage, storm damage control, and water quality benefits.

This document summarizes currently active priority wetlands restoration projects that have been accepted by the Massachusetts Wetlands Restoration Program under the GROWetlands (Groups Restoring Our Wetlands) Initiative. We hope this information will attract new partners to our program and will inspire others to sponsor or otherwise support new restoration projects across the Commonwealth.

Thank you for your continued support for wetlands restoration in Massachusetts.

Very Truly Yours,

Bob Durand
Secretary of Environmental Affairs
Commonwealth of Massachusetts

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Introduction

The Massachusetts Wetlands Restoration Program, along with its many federal, local, business, and non-profit partners, provides technical, financial, and other assistance to proactive wetland restoration projects through its **GROWetlands Initiative (Groups Restoring Our Wetlands)**. By providing information about current wetland restoration sites supported by our program, we hope to attract funding, technical assistance, and other assistance for these priority projects.

It is also our aim to inspire others to sponsor and otherwise support new projects across the state. The projects profiled in this report represent only a portion of the restoration projects MWRP is assisting at this time. Other projects are either in earlier stages of development, or are near or in construction and monitoring.

For more information about individual projects profiled in this report, or about GROWetlands, contact:

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Updates of this document will be prepared from time to time as appropriate and will be posted at the web address above.

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Assabet National Wildlife Refuge/Puffer Pond, Maynard

Watershed: Concord River

Project Sponsor: U.S. Fish & Wildlife Service

MWRP Project Manager: Tim Smith

Acres to be Restored: 90

Others Supporting the Project: Mass. Wetlands Restoration Program

Site Description: The project site consists of an approximately 100-acre complex of forested wetlands, marshes, streams, ponds, and abandoned agricultural lands within the new Assabet River National Wildlife Refuge. Ditched/drained wetlands and road crossings over streams have contributed to the proliferation of *Phragmites australis.* These changes to hydrology have altered natural wetland functions.

Goal of Project: The project goal is to restore natural hydrology and native wetland plant communities by improving culverts and controlling invasive plant species.

Project Description: This project, when fully designed, is expected to involve the reconfiguration of several stream culverts, control of invasive plant species, removal of berms from wetlands, and, potentially, restoration of an abandoned cranberry bog to its original condition as an Atlantic white cedar swamp.

Status of Project: Feasibility evaluation

Project Time Table: Begin feasibility studies Fall 2002.

Immediate Needs: Compile a feasibility study and restoration plan, to include preliminary site survey, hydrologic analyses, and identification of recommended restoration alternatives.

Long-term Needs: Pending outcome of feasibility study, further site survey, engineering, natural resource inventory, wetland delineation, construction drawings and specifications, and permitting services.

Other Considerations: Funding is required to design and obtain permits for the proposed project. Non-federal funding ($40,000 cash or in-kind) is needed to match a National Fish and Wildlife Foundation Grant.

This project was previously identified and described by Epsilon Associates as a component of the Maynard-Assabet Restoration Inventory, one of the first CWRP-supported activities to be completed.

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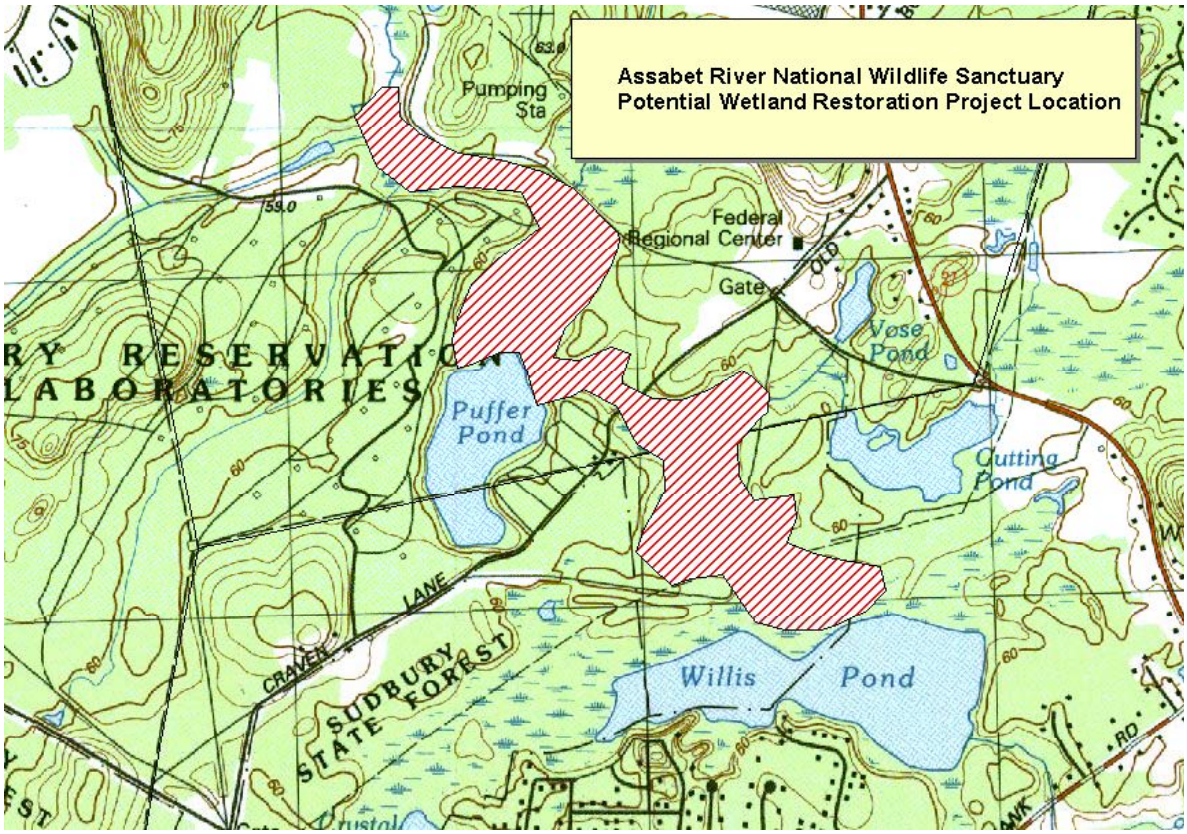

Assabet National Wildlife Refuge - Puffer Pond Site Location Map

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Ballard Street Salt Marsh, Saugus

Watershed: North Coastal

Project Sponsor: Town of Saugus, Northeast Mosquito Control and Wetlands Management District

MWRP Project Manager: Tim Smith

Acres to be Restored: 32

Others Supporting the Project: Metropolitan District Commission (MDC), Mass. Wetlands Restoration Program, ENSR International through the Corporate Wetlands Restoration Partnership, Natural Resources Conservation Service, Saugus River Watershed Council, Environmental Protection Agency, and New England Interstate Water Pollution Control Commission

Site Description: The Ballard Street Salt Marshes are located in East Saugus. This 32-acre site is bounded on the north by Ballard Street, on the east by Route 107 (Salem Turnpike), on the west by Eastern Avenue and on the south by Bristow Street. The project site is also split approximately in half, east and west, by a 30'-tall fill embankment placed and abandoned as part of the I-95 extension project. Marshes at the site are inadequately flushed by tidewater from 2 sources – from the Saugus River via a culvert under Ballard Street and from the Pines River via a second culvert under the now-abandoned portion of Bristow Street. Both culverts are partially obstructed by steel plates that serve as rough tide gates, providing some reduced level of flood control for the low-lying residential neighborhood to the west. The marshes at the site are significantly degraded by this restricted tidal flow, resulting in extensive coverage by common reed (*Phragmites australis*), loss of fisheries and wildlife habitat, impeded drainage of runoff from the abutting neighborhood, and increased risk of fire.

Goal of Project: Phase One: Install a self-regulating tidegate for increased flood protection and restoration of 12 acres of salt marsh east of the I-95 embankment. Phase Two: Excavate 20 acres of *Phragmites*-dominated soil west of I-95 embankment to provide required flood storage and sufficient tidal flushing for reestablishment of salt marsh vegetation.

Project Description: Phase one involves the replacement and relocation of a poorly functioning tidegate with a Waterman-Nekton self-regulating tide gate. A study prepared by the NRCS for MWRP and the Town of Saugus recommends replacement of the faulty gate with a self-regulating tidegate within the tidal creek and relocated at the northern end of the I-95 embankment. This will allow controlled tidal flow upgradient of the tidegate to protect the Eastern Avenue neighborhood from flooding.

Phase two is the excavation of additional flood storage areas west of the I-95 embankment and the removal of the temporary steel plate used as an emergency tidegate at the Saugus River outlet. This will reduce coverage of common reed, increase the density and vigor of native salt marsh vegetation, and enhance fish habitat by improving the connection from the Saugus River and the smaller creek system in this marsh.

Status of Project: Design

Project Time Table:

Immediate Needs: Soil sampling and analysis.

Long-term Needs: Project design, permitting, construction services

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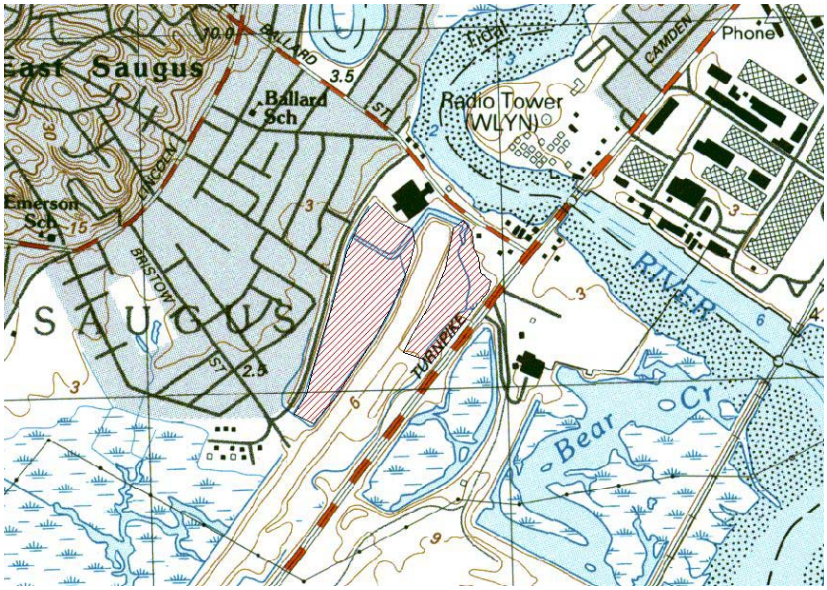
Other Considerations: Phase I (tidegate relocation) permitting underway, through EPA/NEIWPCC.



Ballard Street Site Location Map

Ballard Street Aerial Photo

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Bass Creek Salt Marsh, Yarmouth

Watershed: Cape Cod

Project Sponsor: Yarmouth Conservation Commission

MWRP Project Manager: Georgeann Keer

Acres to be Restored: 37

Others Supporting the Project: Mass. Wetlands Restoration Program

Site Description: This tidal restriction is a walking trail that crosses the Bass Creek in the Callery-Darling Conservation Area, Yarmouth, Massachusetts. Bass Creek is 10 feet wide seaward of the berm narrowing to approximately 5 feet just upstream of the berm. Visual indicators of a restriction on the seaward side include major scour, bank erosion, low marsh slumping, and vegetation die-off. Upstream includes scour and bank erosion. Additionally, the earthen dike above the culvert, which supports the Callery-Darling Recreational Trail, is also severely affected by erosion. Vegetation changes significantly from one side (downstream; salt marsh) of the dike to the other (upstream; brackish tidal marsh), except for the presence of *Phragmites* that grows on both sides.

Goal of Project: The Goal of this project is to remove a tidal restriction and restore more natural tidal flushing to the upstream tidal marsh along Bass Creek while maintaining the Callery-Darling Recreational Trail above the creek crossing.

Project Description: This project will require the removal of the current undersized corrugated metal pipe that lies beneath an earthen dike upon which the trail passes. Because the scouring from the current restriction is so severe and has also damaged the walking trail, construction activities will also include repair and reinforcement of the trail. Depending on the results of a hydrologic study, the metal pipe may be upgraded to a walking bridge. An additional earthen dam exists approximately 300 feet seaward of this restriction. Although it has breached, its removal should also be considered in any remediation work at this site.

Status of Project: Feasibility evaluation

Project Time Table: April 2002: data collection on the tidal restriction.

Immediate Needs: Funding for permitting and construction. An application has been submitted to the Department of Environmental Management's TEA-21 / Recreational Trails Grant Program for permitting and construction of this proposed project.

Long-term Needs: Construction materials and monitoring.

Other Considerations: Additional partners include the Yarmouth Land Trust and the Cape Cod Commission. The Town of Yarmouth conservation agent believes that the DPW may provide some construction services. The Town of Yarmouth may also provide topographic survey work and engineering plans.

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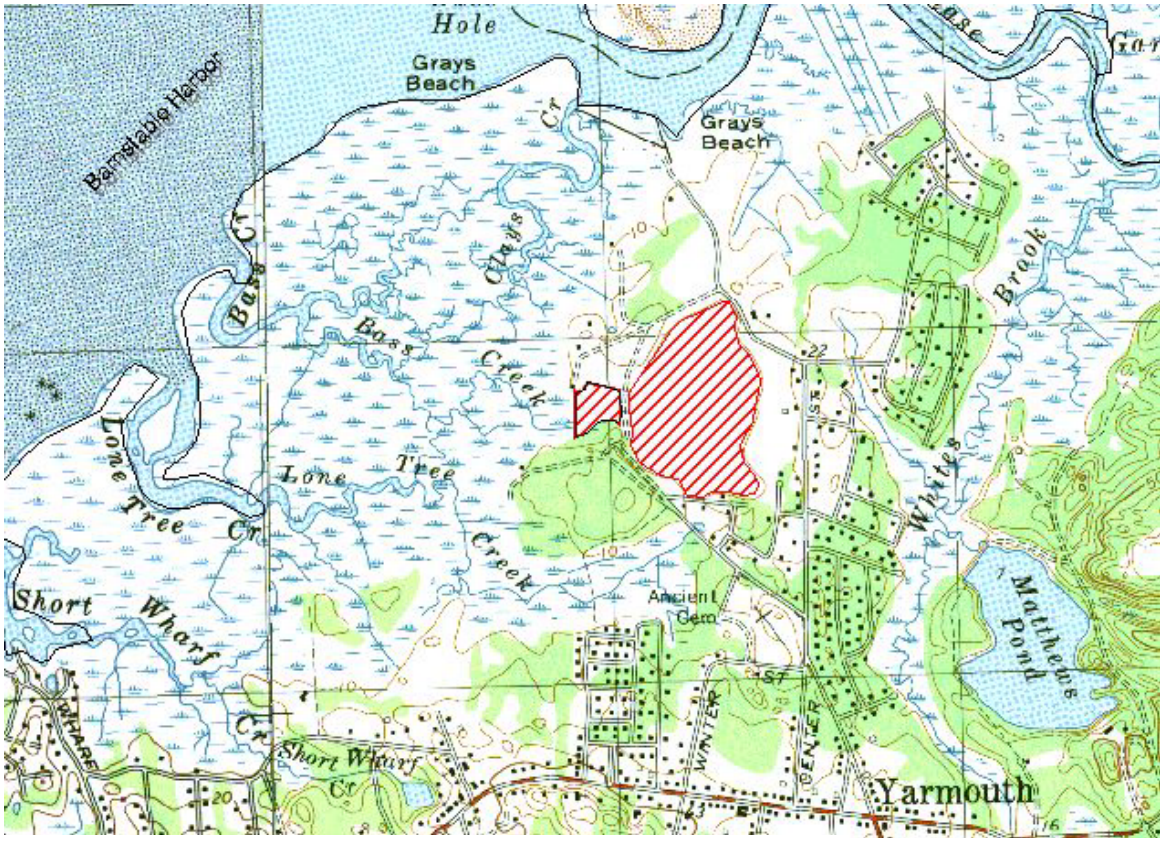

Bass Creek Site Location Map

Bass Creek With Scour Downstream of Culvert

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Bridge Creek Salt Marsh, Barnstable

Watershed: Cape Cod

Project Sponsor: Town of Barnstable and Massachusetts Executive Office of Transportation and Construction

MWRP Project Manager: Steve Block

Acres to be Restored: 40

Others Supporting the Project: Mass. Wetlands Restoration Program, Cape Cod Watershed Team, Cape Cod Commission, Ducks Unlimited, Barnstable Land Trust, Cape Cod Conservation District, Division of Marine Fisheries, and the Corporate Wetlands Restoration Partnership.

Site Description: The project site is located at the intersection of Route 6A and the Bay Colony Railroad in Barnstable. The Bridge Creek marsh is crossed by both the railroad and Route 6A in this area. Undersized culverts in each crossing restrict tidal flushing to the upgradient marsh. Much of the upgradient marsh has been colonized with common reed (*Phragmites australis*) or has been converted to shrub and forested swamp. This marsh is located in the state-designated Barnstable Harbor Area of Critical Environmental Concern.

Goal of Project: The goal of this project is to restore a more normal tidal hydrology to a degraded 40+-acre salt marsh in Barnstable while protecting low-lying properties and other sensitive resources.

Project Description: This project consists of two phases. The first phase of the project will replace an undersized culvert beneath the railroad line with a 10' by 10' box culvert. Phase I will be constructed in March 2003. The second phase of the project will replace the undersized culvert beneath State Route 6A with a 10' by 10' box culvert. Phase II likely will be constructed in late 2003.

Status of Project: Permitting

Project Time Table: March 2003: Construct Phase I of the project. Late 2003: Construct Phase II of the project.

Immediate Needs: Construction funding for both phases.

Long-term Needs: Funding for Phase I project construction, which is estimated at $350,000 and for Phase II construction, estimated at $250,000.

Other Considerations: The project is on a very strict schedule due to a very narrow construction window in spring 2003.

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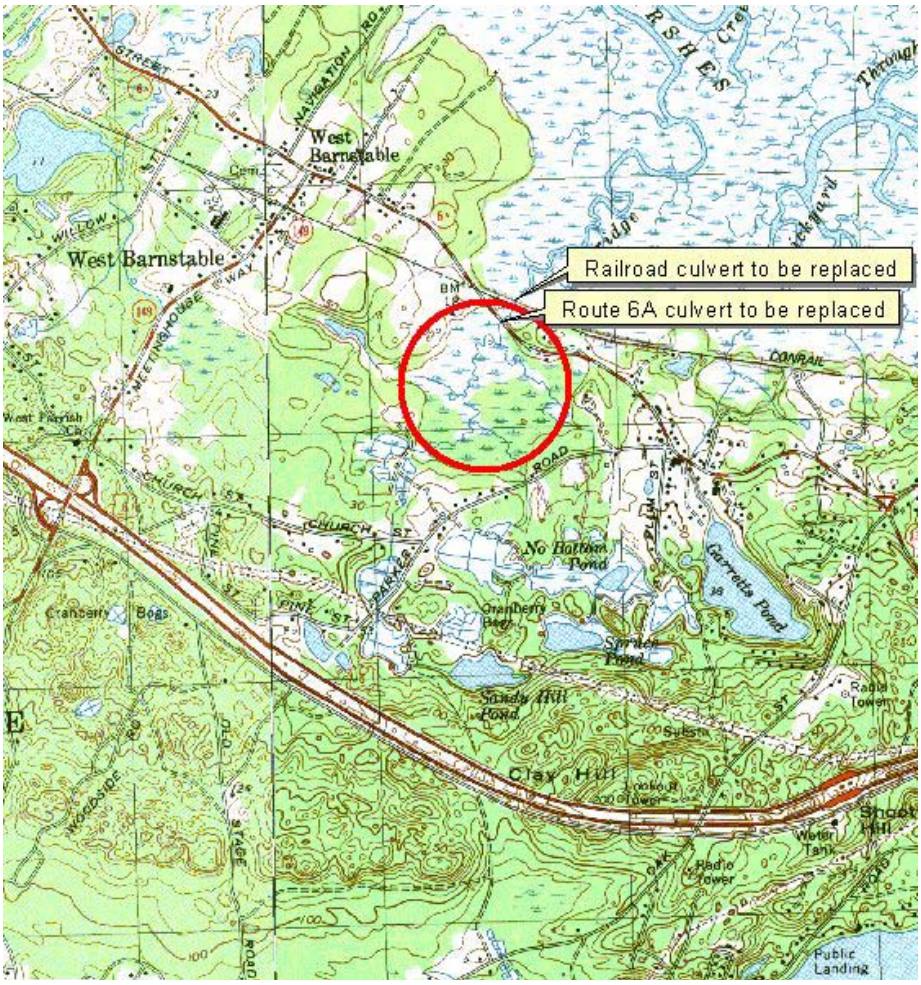

Bridge Creek Site Location Map

Bridge Creek Aerial Photo

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Cow Yard, Dartmouth

Watershed: Buzzards Bay

Project Sponsor: Dartmouth Natural Resources Trust and the Dartmouth Conservation Commission

MWRP Project Manager: Steve Block

Acres to be Restored: 18

Others Supporting the Project: Mass. Wetlands Restoration Program, Corporate Wetlands Restoration Partnership, Fish America Foundation, Natural Resources Conservation Service, and Buzzards Bay Project

Site Description: The project site is a 30-acre parcel of land located just north of Smith Neck in Dartmouth. The Dartmouth Natural Resources Trust (DNRT) owns the land. The Cow Yard marsh is divided into two separate areas - a west cell, which is approximately 7-acres, and an east cell, which is approximately 9-acres. A single, 192-feet long, 19" x 30" elliptical concrete arch culvert conveys tidal flow under Beach Avenue between Buzzards Bay and the west or "down-gradient" cell. On the upstream side of this culvert, a manmade channel connects the west cell of the marsh with the culvert. Fresh water flows into the eastern or "up-gradient" cell of the marsh from Teal Pond to the east. There are two smaller parallel culverts located under Juniper Lane, connecting the eastern and western marsh cells. Studies have shown that these two culverts, which were replaced in 1991, do not significantly restrict the tidal flow entering and leaving the east cell. The focus of this restoration will be on the Beach Avenue culvert due to the fact that it controls tidal inundation throughout the marsh and poses a significant restriction to tidal flows to the marsh.

Goal of Project: The goal of this project is to restore a more normal tidal hydrology to an 18-acre tidally restricted salt marsh while protecting adjacent low-lying properties from increased tidal inundation.

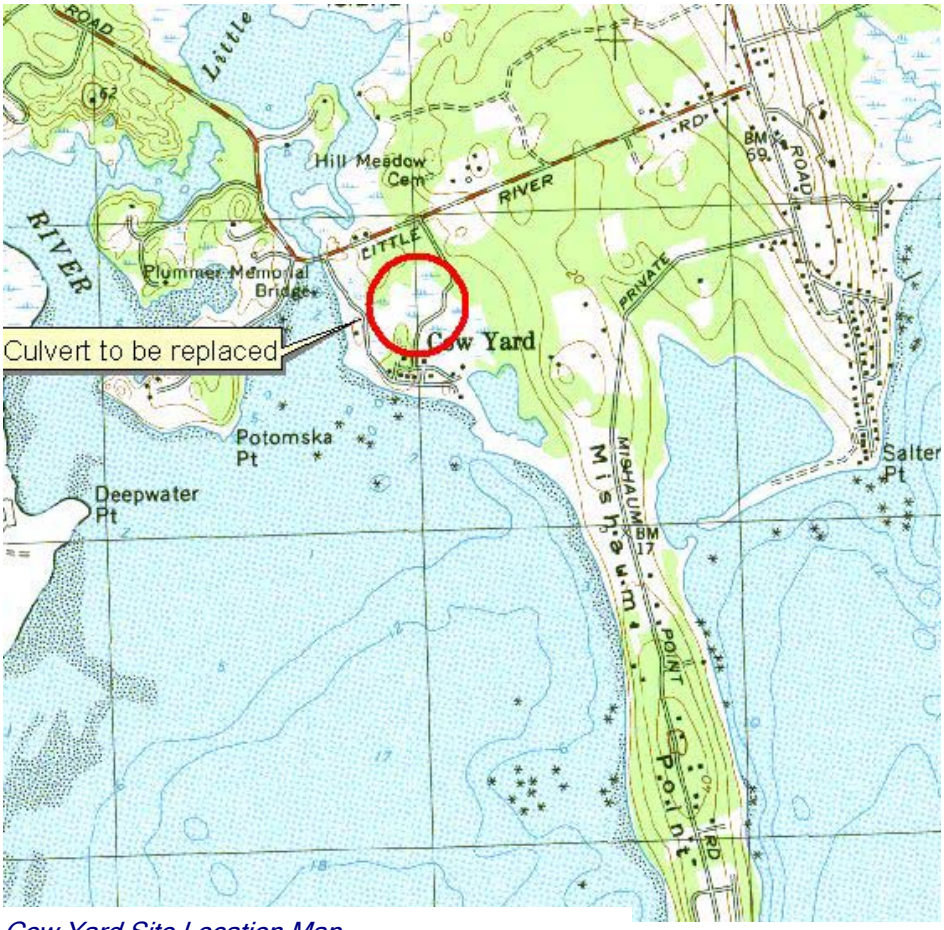
Project Description: The project consists of replacing a 192-foot long, 19-inch by 30-inch elliptical concrete culvert with a 3-foot by 4-foot concrete culvert to enhance tidal flows to the tidally restricted marsh.

Status of Project: Permitting.

Project Time Table: November/December 2002: Project construction.

Immediate Needs: Construction funding and related services

Other Considerations:



Cow Yard Site Location Map

Cow Yard Upstream of Culvert

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Herring River, Wellfleet

Watershed: Cape Cod

Project Sponsor: National Park Service, Cape Cod National Seashore

MWRP Project Manager: Steve Block

Acres to be Restored: 400+

Others Supporting the Project: Mass. Wetlands Restoration Program

Site Description: The Herring River is located in Wellfleet, Massachusetts. The estuarine habitat of the Herring River has been severely degraded by drainage and the construction of a dike (1908) fitted with sluice and tidal gates, at the entrance to the river. The dike and operation of the sluice and tidal gates have prevented seawater from Wellfleet harbor and Cape Cod Bay from entering most of the system. As a result, hundreds of acres (400+) of the original intertidal salt marshes have been converted into areas of upland vegetation, eliminating habitat for estuarine plants and animals.

Goal of Project: The goal of this project is to restore a normal tidal hydrology to a severely degraded, former salt marsh system bordering the Herring River.

Project Description: This project includes reconstructing a former dike to protect low-lying properties from adverse impacts of increased tidal flows, and opening or removing existing tide gates to increase tidal exchange to the extensive wetland system.

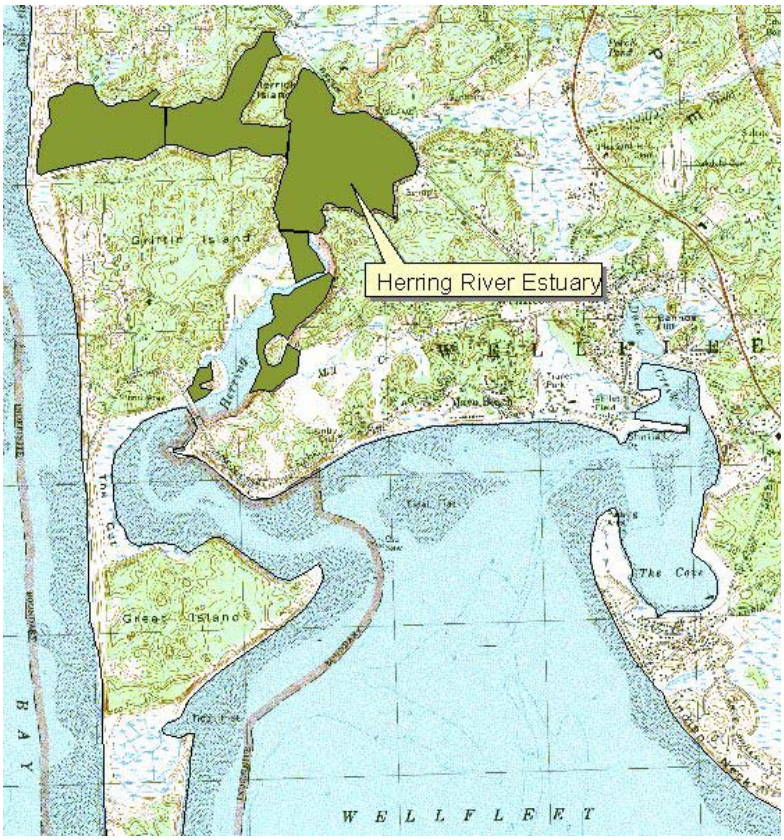
Status of Project: Feasibility Study

Project Time Table: No firm timelines have been set for this project.

Immediate Needs: Funding or in-kind services to design and permit the flood control dike.

Long-term Needs: Funding or in-kind services to construct the flood control dike and to monitor the effects of opening the tide and sluice gates.

Other Considerations: This is the largest known salt marsh restoration project in Massachusetts.



Herring River Site Location Map

Aerial Photo of Dike on Herring River That is Obstructing Tidal Flow

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Island Road, Essex

Watershed: North Coastal

Project Sponsor: Town of Essex

MWRP Project Manager: Tim Smith

Acres to be Restored: 18

Others Supporting the Project: Mass. Wetlands Restoration Program, National Marine Fisheries Service, Ducks Unlimited

Site Description: Island Road is a shallow causeway extending from Route 133 to a dead end town landing at Essex Bay. Two culverts were installed at low points under Island Road to facilitate drainage of two small, unnamed creeks running between Essex Bay and the Castle Neck River.

Goal of Project: Restore tidal flow to a salt marsh restricted by Island Road.

Project Description: The project will involve the replacement of an undersized, failing culvert under Island Road. A second, inadequate culvert may also be addressed during the design process and replaced if warranted. Additional work will include the stabilization of the road banks and potential removal of sand and gravel washed into the creeks.

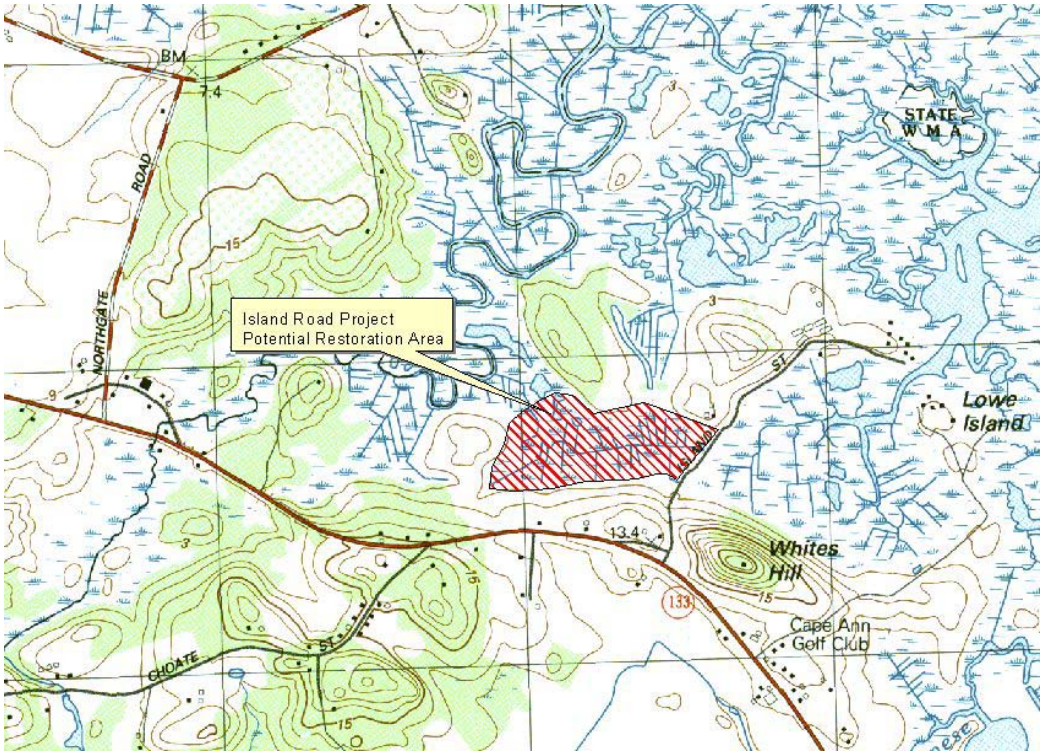
Status of Project: Permitting

Project Time Table: Construction expected fall/winter 2002.

Immediate Needs:

Long-term Needs:

Other Considerations:



Island Road Site Location Map

Island Road Culvert on Upstream Side

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Jericho Road Salt Marsh, Scituate

Watershed: South Coastal

Project Sponsor: Town of Scituate

MWRP Project Manager: Tim Smith

Acres to be Restored: 5.4

Others Supporting the Project: Mass. Wetlands Restoration Program, Mass. Coastal Zone Management, and Mass. Bays Program

Site Description: The Sand Hills neighborhood is a densely developed residential neighborhood in Scituate. The project area is isolated from tidal flow by a series of road crossings and other structures. The salt marsh also receives excessive inputs of freshwater run-off, which is impounded by inadequately sized culverts, further impacting the functions and values of the marsh.

Goal of Project: The goal of this project is to restore tidal flow to approximately five acres of degraded salt marsh in the Sand Hills area of Scituate.

Project Description: As part of a larger project to address long-term flooding and water quality problems in a densely developed beachfront neighborhood, a new outfall pipe will be retrofitted to allow tidal flow into an isolated section of degraded salt marsh. In order to accommodate sufficient tidal flushing and provide optimal flood protection for the neighborhood, it is likely a self-regulating tidegate will be employed along with the new culverts and outfall.

Status of Project: Feasibility evaluation

Project Time Table: Begin feasibility study in 2003.

Immediate Needs: Survey, engineering, and design to incorporate salt marsh restoration elements, such as the use of a self-regulating tidegate, into the town's flood control.

Long-term Needs: Not known.

Other Considerations: The Town of Scituate has applied for a MEMA/DEM grant to address flooding issues. The Mass Bays Program and Mass CZM are working with the town conservation commission and DPW to incorporate salt marsh restoration design elements into the proposed flood control project. Notification of the grant funding is pending.

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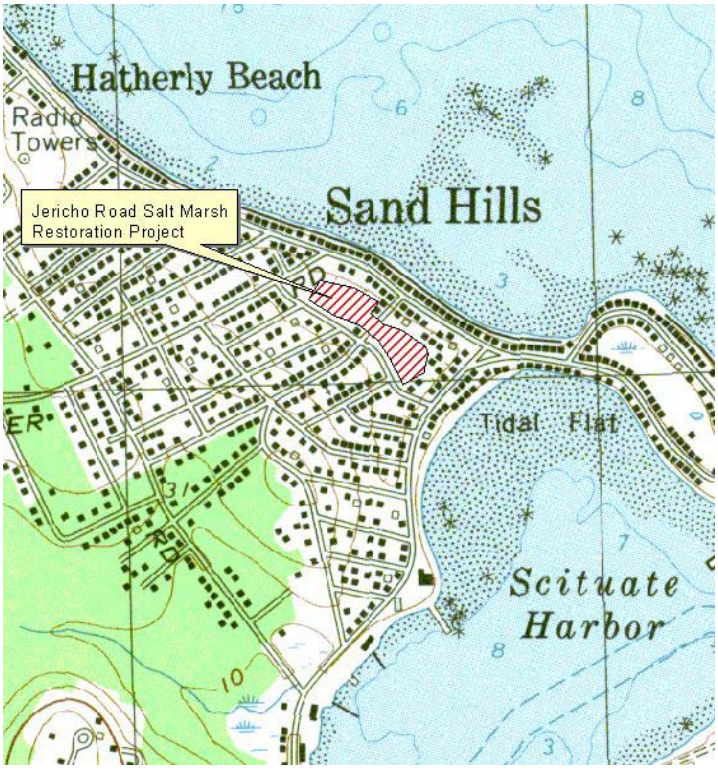

Jericho Road Site Location Map

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Lincoln Park, Lexington

Watershed: Shawsheen River

Project Sponsor: Town of Lexington, Lincoln Park Committee

MWRP Project Manager: Tim Smith

Acres to be Restored: 1-2

Others Supporting the Project: Mass. Wetlands Restoration Program

Site Description: The potential project area is a portion of the 60-acre Lincoln Park, all of which was historic wetland. The park was created from a former municipal landfill in the 1980s. The existing wetland area, approximately 11 acres, is degraded by the channelization and burying of Vine Brook, and by filling. The Lincoln Park Committee has constructed an interpretive trail and boardwalk at the site.

Goal of Project: The goal of this project is to restore ecological functions and values to a degraded wetland area within Lexington's Lincoln Park. This will be achieved primarily by delighting approximately 300 linear feet of a culverted portion of Vine Brook and removing selected piles of fill that have been placed in the wetland.

Project Description: The Lincoln Park Committee has recently completed a master plan for the Park. The plan recommends delighting a portion of Vine Brook and enhancing the shoreline of a small pond on the site with wetland plantings. In addition, the LPC is considering conducting a feasibility study to investigate the potential for further wetland restoration by fill removal and other improvements to natural hydrology.

Status of Project: Feasibility evaluation

Project Time Table: Complete feasibility study Spring 2003.

Immediate Needs: Hydrologic study, engineering, and permitting are required to enable the stream day-lighting and pond enhancement portion of the project to advance.

Long-term Needs: Funds/services for construction and identification of further wetland restoration opportunities are also required.

Other Considerations: Implementation of any proposed restoration actions may be effected by proposed improvements to the adjacent upgradient ball fields.

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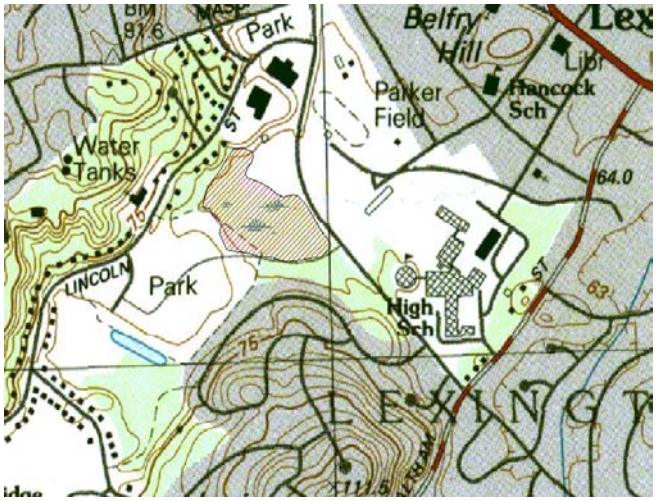

Lincoln Park Site Location Map

Old Farm Pond at Lincoln Park

Construction Rubble In Lincoln Park Wetland

Manhole to Piped Vine Brook

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Mattapoisett Neck, Mattapoisett

Watershed: Buzzards Bay

Project Sponsor: Mattapoisett Conservation Commission

MWRP Project Manager: Georgeann Keer

Acres to be Restored: 40

Others Supporting the Project: Mass. Wetlands Restoration Program, Buzzards Bay Project, Coastal Zone Management, and Corporate Wetlands Restoration Partnership

Site Description: The Mattapoisett Neck marsh is an extensive salt marsh upgradient of Mattapoisett Neck Road in Mattapoisett, Massachusetts. Two parallel roads cross this marsh approximately 100 yards apart. The lower (seaward) road was abandoned when the higher (landward) road was constructed. The landward road (Mattapoisett Neck Road) contains a 6-foot diameter culvert that conveys flows from Buzzards Bay to the upgradient marsh. However, the abandoned road contains a 2-foot diameter culvert that prevents full tidal flows from entering the larger culvert in Mattapoisett Neck Road and, ultimately, into the extensive upgradient salt marsh.

Goal of Project: The goal of this project is to restore tidal flow to both the section of marsh between Mattapoisett Neck Road and the abandoned road, and to an additional 40 acres upstream of Mattapoisett Neck Road.

Project Description: This project includes removing an undersized culvert in an abandoned road to allow more normal tidal flows to access the upgradient marsh. This project may also include removing portions of the abandoned road to directly restore the underlying salt marsh.

Status of Project: Design

Project Time Table: August 2002: Finish preliminary restoration design. November/December 2002: Project construction

Immediate Needs:

Long-term Needs: This project may require funding and/or in-kind construction services to remove the culvert and possibly portions of the abandoned road.

Other Considerations: In addition to this project, the Mattapoisett Department of Public Works and Sewers is planning to relocate a waterline underneath the abandoned road, which currently is the only supply to Mattapoisett Neck. Timing this project, to have design and permits ready before the town removes the waterline, may provide the opportunity to combine construction for both projects. This would save on project cost since the town will likely have to rent the construction equipment necessary for both projects.

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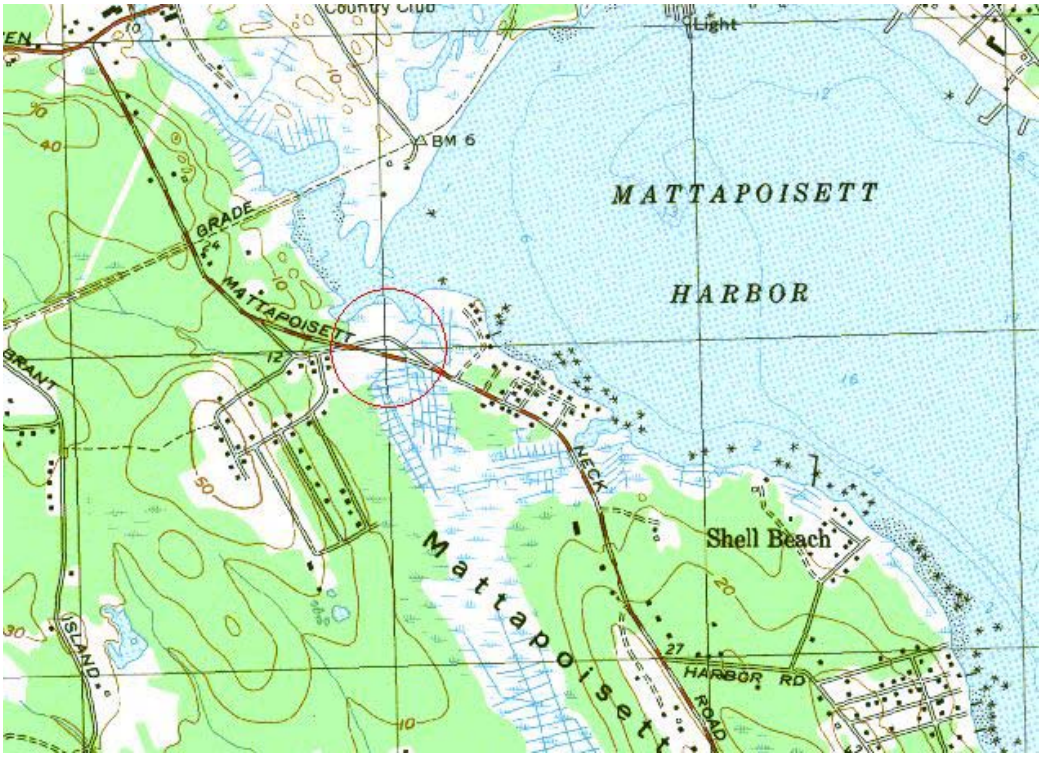
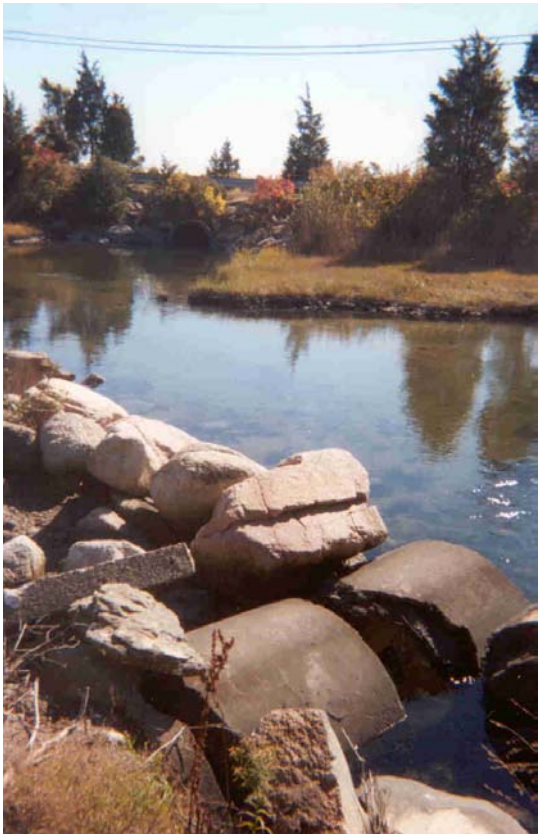


Mattapoisett Neck Site Location Map



Looking upstream from the abandoned road and undersized culvert. The newer Mattapoisett Neck Road and larger culvert are in the background.

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Mill Creek, Chelsea

Watershed: Boston Harbor

Project Sponsor: Chelsea Greenspace Committee

MWRP Project Manager: Tim Smith

Acres to be Restored: 0.5

Others Supporting the Project: BSC Group, Boston Harbor Watershed Team, National Marine Fisheries Service, Environmental Protection Agency, Mass. Riverways Program, Mass. Wetlands Restoration Program

Site Description: The Locke Street salt marsh is located just east of Route 1 at the interchange with Route 16.

Goal of Project: Proposed restoration activities will involve restoration of appropriate contours in the estuary for replanting of low marsh vegetation. Acreage currently invaded with *Phragmites* will be restored to *Spartina* habitat.

Project Description: The Mill Creek estuary is a wetland of approximately 45 acres, at the head of Chelsea Creek, located between the communities of Chelsea and Revere. The Mill Creek 2000 Restoration Project is a collaborative, community-based effort to restore biological value to badly degraded estuarine wetlands in metropolitan Boston and to integrate the restored system into the abutting urban neighborhoods as an environmental amenity. The overall project has been designed for three phases. The specific project site proposed for Phase I (Locke St.) is a small portion of the larger degraded salt marsh that has been impacted by *Phragmites*, litter, and road wash sediments deposited via upstream highway drainage structures.

Status of Project: Final design and construction

Project Time Table:

Immediate Needs: Soil sampling and analysis

Long-term Needs:

Other Considerations:

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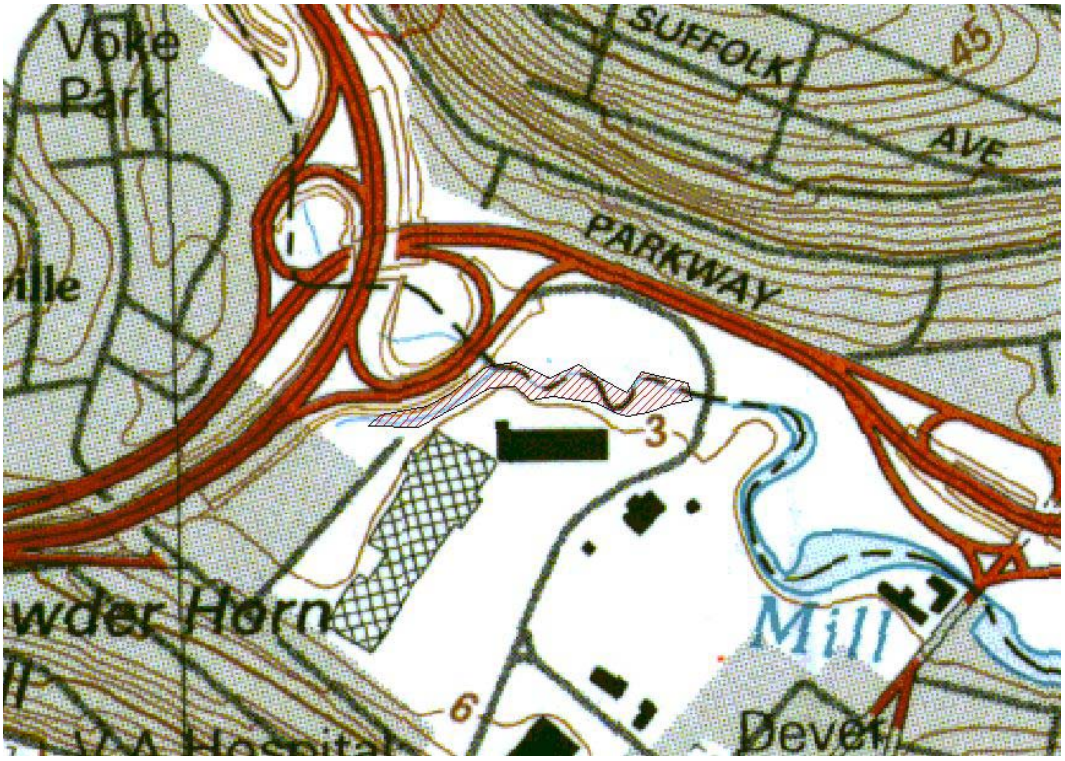

Mill Creek Site Location Map

Mill Creek Aerial Photo

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Namskaket Salt Marsh, Brewster

Watershed: Cape Cod

Project Sponsor: Department of Environmental Management

MWRP Project Manager: Steve Block

Acres to be Restored: 10

Others Supporting the Project: Mass. Wetlands Restoration Program, US Fish & Wildlife Service, Cape Cod Conservation District and Corporate Wetlands Restoration Partnership. USFWS has awarded the project a $45,000 grant towards construction. An environmental consulting company (Vanasse Hangen Brustlin, Inc.) is donating the necessary permitting services through CWRP.

Site Description: The site is located at the Cape Cod Rail Trail crossing of Namskaket Creek at the Brewster/Orleans town line. An old, failing culvert severely restricts Namskaket Creek from entering the upgradient, former salt marsh. This 10-acre area is now dominated by common reed, poison ivy, and woody plant species.

Goal of Project: The goal of this project is to restore a more normal tidal hydrology to a severely degraded salt marsh at the Brewster/Orleans town line.

Project Description: This project includes replacing a severely undersized, failing culvert with two 5-foot diameter culverts to restore tidal flows to the tidally restricted marsh.

Status of Project: Permitting

Project Time Table: January 2003: Project construction.

Immediate Needs: Project needs include funding (approximately $15,000) or in-kind services to construct the project and to provide construction management and oversight services.

Long-term Needs

Other Considerations:

Namskaket Marsh Site Location Map

Namskaket Marsh Upstream from Culvert

Newman Road / Old Town Hill Salt Marsh, Newbury

Watershed: Parker River

Project Sponsor: The Trustees of Reservations

MWRP Project Manager: Georgeann Keer

Acres to be Restored: 20

Others Supporting the Project: Town of Newbury, 8 Towns & the Bay, Parker River Clean Water Association, Massachusetts Audubon Society, and MWRP

Site Description: The Old Town Hill Salt Marsh is a 20-plus-acre salt marsh upgradient of Newman Road in Newbury, Massachusetts. Owned by The Trustees of Reservations, this salt marsh does not receive full tidal flows due to an undersized culvert that conveys the tidal creek that feeds the salt marsh beneath Newman Road, a town owned road. Additionally, there is an earthen road, which separates the eastern and western portions of the marsh from each other. The result is blockage of the tidal flow across the surface of the marsh (at high tide) from the western tidal source.

Goal of Project: The Goal of this project is to remove a tidal restriction and restore more natural tidal flushing to the upstream tidal marsh along Newman Road, Newbury

Project Description: This project will first focus on restoring tidal flow via the earthen road that restricts tidal flow across the marsh surface. This will be accomplished by creating hardened swales along portions of the earthen road. By lowering the road with hardened swales, surface flow will move more freely across the surface of the marsh at high tide and provide greater flushing between the east-west connections of the restricted marsh. The swales will be constructed so that both pedestrian use of the road will be preserved. Vehicle access must be preserved because the road is also a maintenance road for the Trustees of Reservations. In addition to the earthen road restriction, the 2.5-foot metal culvert on Newman Road also creates a restriction to the tidal flushing of the Old Town Hill Salt Marsh. The invert of the culvert on the upstream side is 1 foot higher than the invert on the downstream side. The tidal range on the upstream side is 31.2 inches shorter than the tidal range on the downstream side. Both sides of the culvert show signs of erosion, scour, and slumping of marsh. Replacement of the metal culvert with a larger structure, such as a concrete box culvert, will aid in relieving this restriction and provide better flushing to Old Town Hill Salt Marsh.

Status of Project: Feasibility evaluation

Project Time Table: Planning for the work on the earthen road to commence Summer 2002.

Immediate Needs: This project will need funding or in-kind services (construction and materials) for the replacement of the culvert on Newman Road.

Long-term Needs: Monitoring.

Other Considerations: Funding for the construction of hardened swales on the earthen road was obtained through a Gulf of Maine NOAA Partnership grant. Beals & Thomas, Inc., a CWRP donor, is providing survey and permitting work for this site. The Town of Newbury may provide construction services as an in-kind donation toward the replacement of the culvert on Newman Road.

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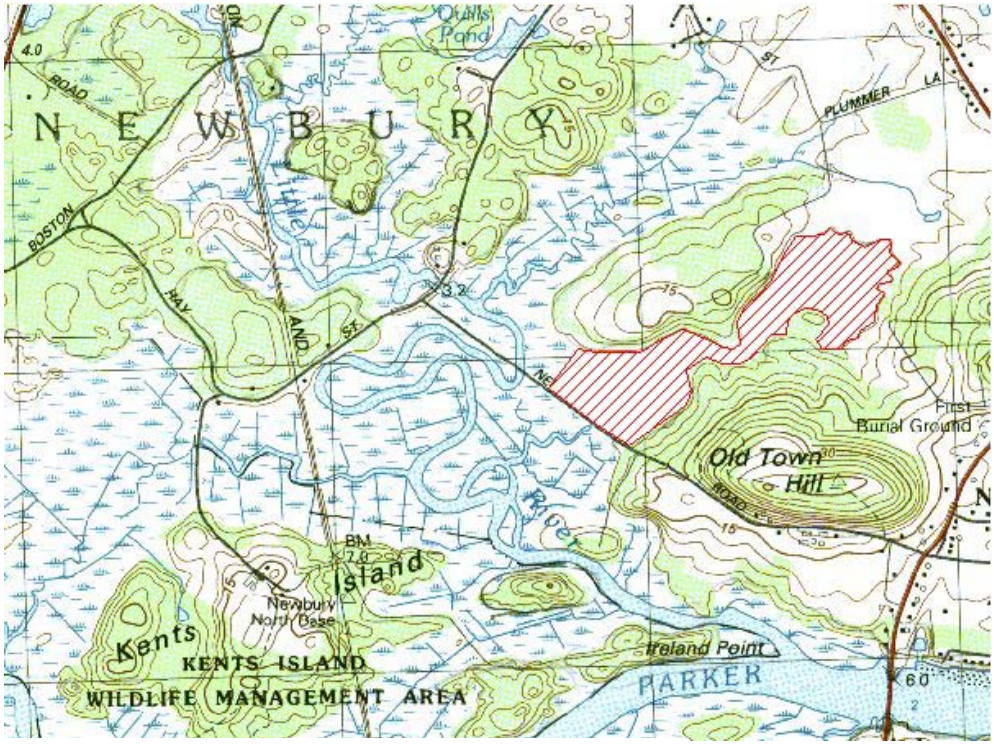

Newman Road Site Location Map

Newman Road Upstream of Culvert Showing Scour Pool

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North Pool, Newbury

Watershed: Merrimack River

Project Sponsor: US Fish & Wildlife Service

MWRP Project Manager: Tim Smith

Acres to be Restored: 140

Others Supporting the Project: Mass. Wetlands Restoration Program, Corporate Wetlands Restoration Partnership

Site Description: The North Pool is one of three large freshwater impoundments within the Parker River National Wildlife Refuge (PRNWR), located on Plum Island, in the towns of Newbury and Rowley. The U.S. Fish & Wildlife Service created the impoundments in the 1940s to provide habitat for waterfowl. For the North Pool, a 1.5-mile earthen berm was built, isolating a 140-acre section of salt marsh from tidal flow. The berm was constructed approximately 500-meters out onto the marsh. To the west are extensive areas of functioning salt marsh, forming the eastern edge of Plum Island Sound. A water control structure has been installed in the berm allowing limited saltwater into the pool, but it is clearly inadequate to convey tidal flow sufficient to support salt marsh vegetation.

Goal of Project: Restore tidal flow to a 140-acre impoundment by removing portions of, and/or installing culverts in, a 1.5-mile dike constructed by the USFWS c. 1950.

Project Description: The general approach to the restoration will be to reintroduce tidal flow to the North Pool, allowing for the natural recolonization of native salt marsh vegetation. Potential restoration options may include removing portions of the berm, filling or plugging ditches within the pool, excavating filled portions, and/or removing other obstructions to tidal flow.

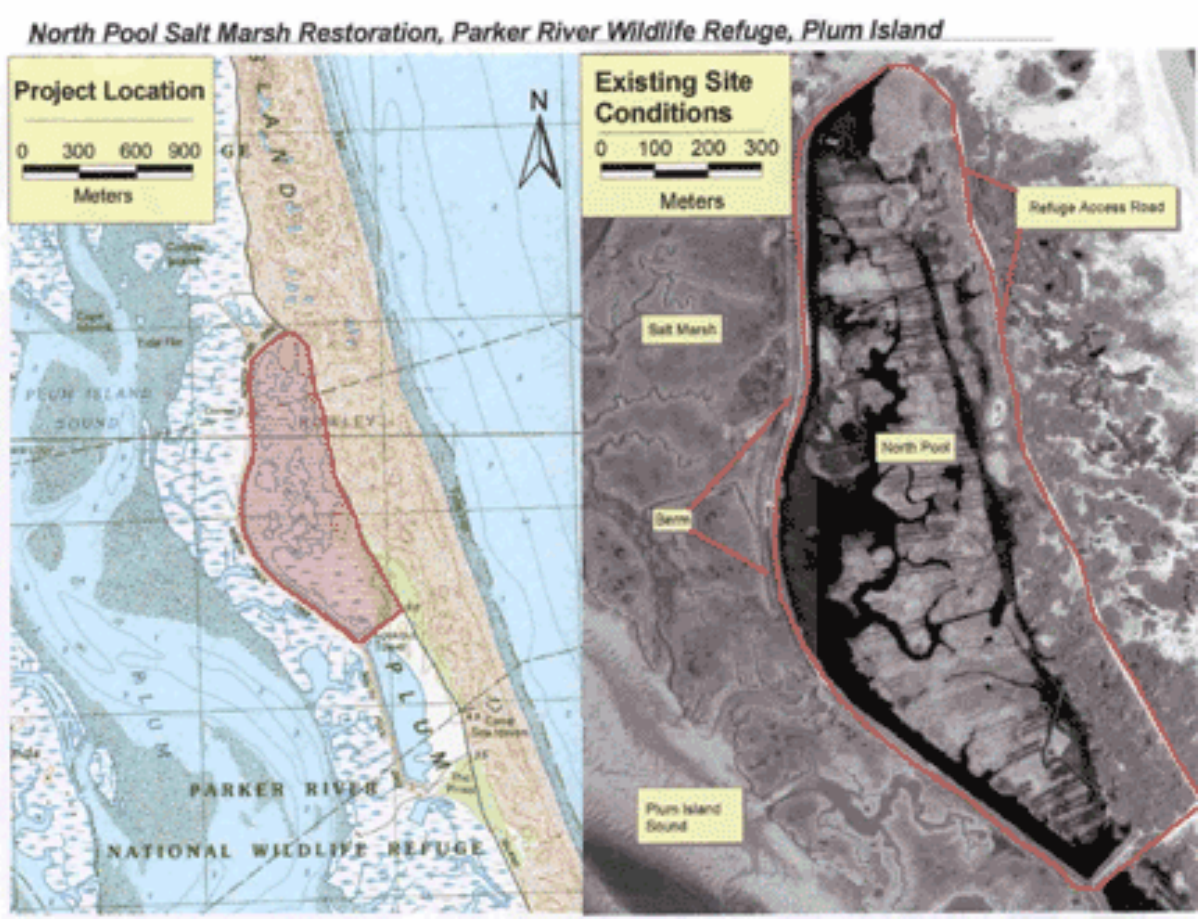
Status of Project: Feasibility evaluation

Project Time Table: Draft Conceptual Restoration Plan expected Fall 2002 (Normandeau); Phase II of project design development 2nd half of 2002; final design and permitting, 2003, construction late 2004

Immediate Needs: Hydrologic analysis

Long-term Needs: Project design, permitting, construction services

Other Considerations:



North Pool site Location Map

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Plum Bush Creek Culvert Replacement, Newbury

Watershed: Merrimack River

Project Sponsor: Town of Newbury

MWRP Project Manager: Tim Smith

Acres to be Restored: 10

Others Supporting the Project: Mass. Wetlands Restoration Program

Site Description: Plumbush Creek is a 1.5-mile long tidal channel flowing between the Plum Island River and Merrimack River. In the 1950s, construction of the Plum Island Turnpike resulted in filling in of a section of the channel, cutting off the connection between the two rivers and altering tidal flow. Since then, sedimentation has increased on the north side of the creek and *Phragmites* has invaded the salt marsh.

Goal of Project: Restore unrestricted tidal hydrology to a creek that has been bisected by roadway fill.

Project Description: The project involves the design and installation of a suitably sized culvert under Plum Island Turnpike, reconnecting the two creek sections, restoring natural tidal flow, and facilitating fish passage between the Merrimack and Plum Island Rivers.

Status of Project: Feasibility evaluation

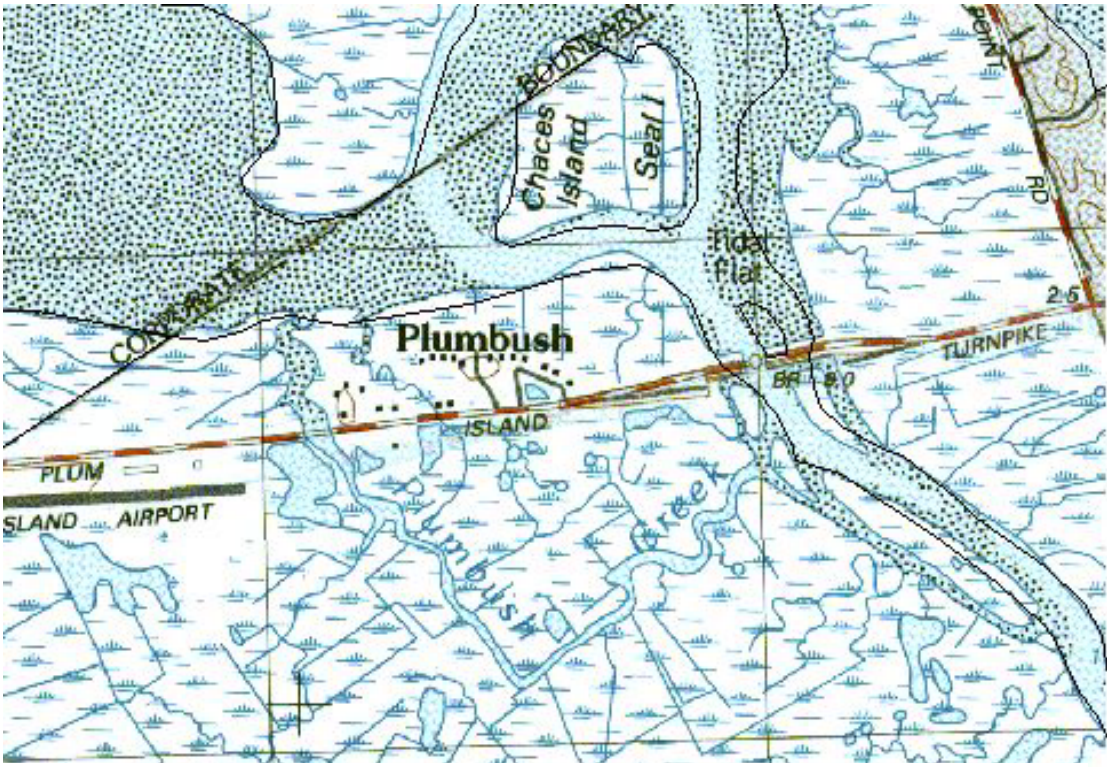
Project Time Table: ACOE study to commence in 2002.

Immediate Needs: Design plans.

Long-term Needs: Local/state permitting, construction costs.

Other Considerations: The Plum Island Water and Sewer project, expected for construction sometime in 2003, has agreed to bury pipes at an elevation suitable for culvert installation.

The ACOE has agreed to conduct a Section 22 study to design this project. MRWP is providing $40,000 in matching funds.



Plumbush Creek Site Location Map

Plumbush Creek Salt Marsh

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Quivett Creek, Brewster

Watershed: Cape Cod

Project Sponsor: Town of Dennis Natural Resources Department

MWRP Project Manager: Steve Block

Acres to be Restored: 11

Others Supporting the Project: Mass. Wetlands Restoration Program, Towns of Dennis and Brewster, National Marine Fisheries Service, US Fish & Wildlife Service, National Fish and Wildlife Foundation, Gulf of Maine Council, FishAmerica Foundation, and Corporate Wetlands Restoration Partnership. NMFS and USFWS, through NFWF, have provided the project with a grant toward project construction. A corporate donor, The Louis Berger Group, is providing pre-construction fish monitoring and engineering design and permitting services.

Site Description: The project site is located on an abandoned road (Sea Street) that crosses Quivett Creek and its associated salt marsh at the Dennis/Brewster town line. Two failing culverts both restrict full tidal exchange with the 11-acre upgradient marsh and prevent anadromous fish from accessing an upgradient spawning pond. The tidally restricted marsh is mostly vegetated with common reed (*Phragmites australis*).

Goal of Project: The goal of this project is to restore tidal flows to an 11-acre tidally restricted salt marsh and to improve anadromous fish passage to an upgradient spawning pond while protecting adjacent low-lying properties.

Project Description: This project includes removing two undersized failing culverts from Sea Street and replacing these with a larger box culvert.

Status of Project: Design

Project Time Table: Fall 2002: Submit permit applications.
Spring 2003: Project construction.

Immediate Needs: Funds and/or in-kind services to purchase and install the proposed box culvert.

Long-term Needs:

Other Considerations:

Quivett Creek Site Location Map

Culvert

Quivett Creek Marsh

Quivett Creek Fish Sampling

South Cape Beach, Mashpee

Watershed: Cape Cod

Project Sponsor: Department of Environmental Management

MWRP Project Manager: Steve Block

Acres to be Restored: 15+

Others Supporting the Project: Mass. Wetlands Restoration Program, Mass. Coastal Zone Management, Waquoit Bay National Estuarine Research Reserve, and Department of Environmental Management

Site Description: The South Cape Beach salt marsh restoration site is located in the Department of Environmental Management-run Waquoit Bay National Estuarine Research Reserve in Mashpee, Massachusetts. The salt marsh is bisected by the state beach road (now abandoned) and by the town beach-parking road (currently in use).

Goal of Project: The goal of this project is to restore a more normal tidal regime to a 15+-acre salt marsh in Mashpee.

Project Description: This project is currently being designed. Preliminary plans call for the replacement of two undersized culverts with larger culverts sized to provide increased tidal exchange. A potential piece of this project may include the removal of a portion of an abandoned road that crosses this marsh.

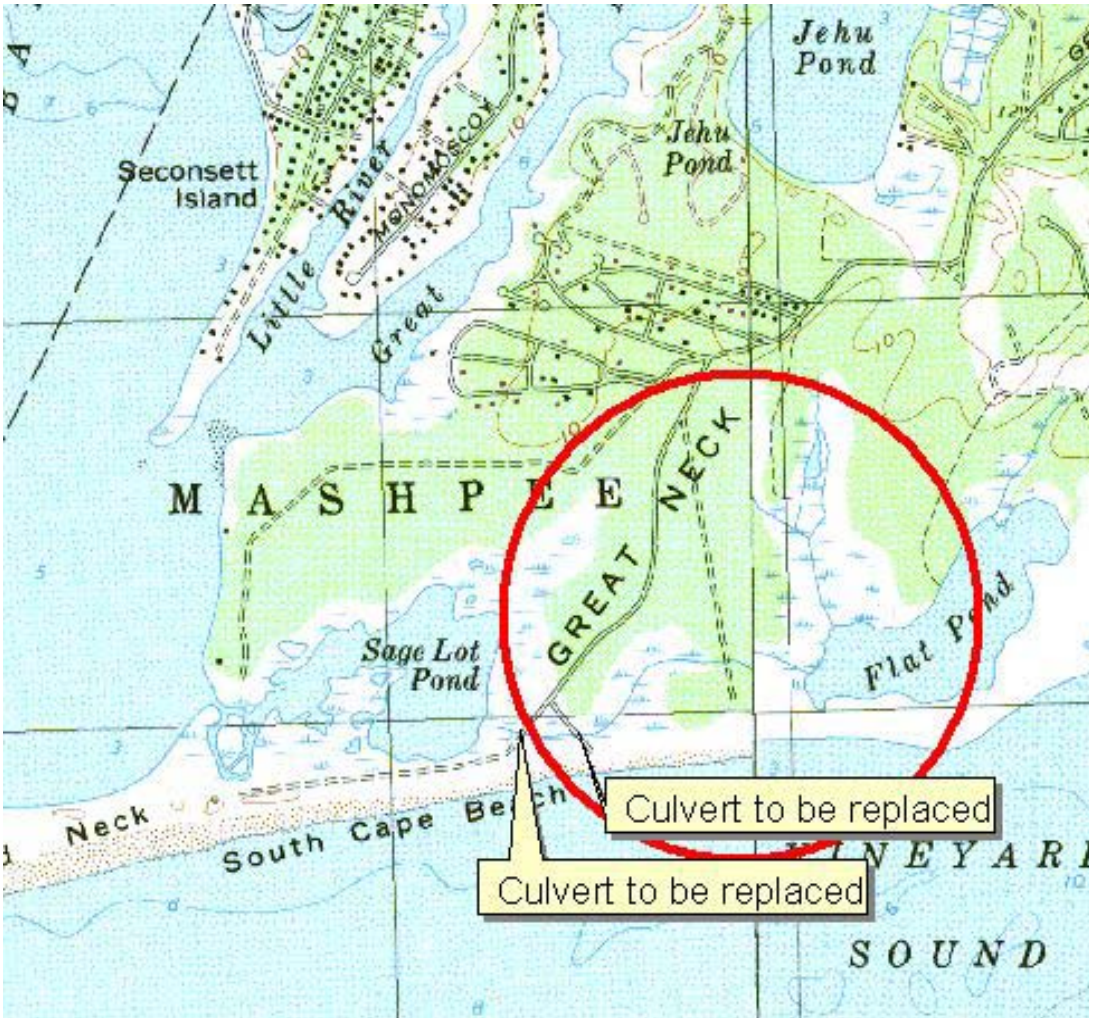
Status of Project: Design

Project Time Table: July 2002: Complete restoration design.
November 2002: Begin permitting process. Fall 2003: Project Construction.

Immediate Needs:

Long-term Needs: Funding and or in-kind services for project permitting and construction.

Other Considerations:



South Cape Beach Site Location Map

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State Game Farm, Sandwich

Watershed: Cape Cod

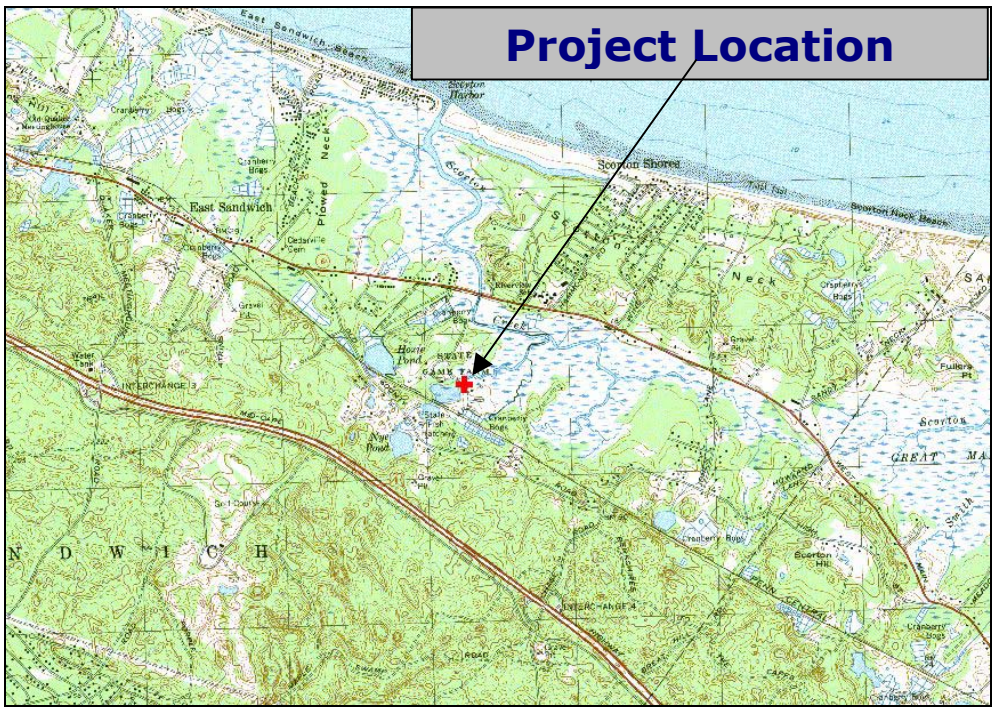
Project Sponsor: Thornton Burgess Society

MWRP Project Manager: Tim Smith

Acres to be Restored: 8

Others Supporting the Project: Mass. Wetlands Restoration Program, Mass. Fisheries and Wildlife, Ducks Unlimited, National Marine Fisheries Service

Site Description: The project site is located within the old State Game Farm and Fish Hatchery in East Sandwich. The 177-acre game farm is owned by Mass. Fisheries and Wildlife, but is operated under a stewardship agreement by the Thornton Burgess Society, a local land conservation group. As part of their land stewardship and management activities, the Society has removed most of the old buildings, animal cages, and other structures and is actively restoring the land to native habitat. Most of this work has been conducted by a large contingent of volunteers. The majority of the land consists of early successional woodlands dominated by Eastern white pine, Eastern red cedar, pitch pine, scrub oak, and white oak. These upland areas are directly adjacent to and upgradient of an extensive complex of intertidal wetlands covering several thousand acres behind the barrier beach of Sandy Neck. Most of this area is the Sandy Neck/Barnstable Harbor Area of Critical Environmental Concern (ACEC).

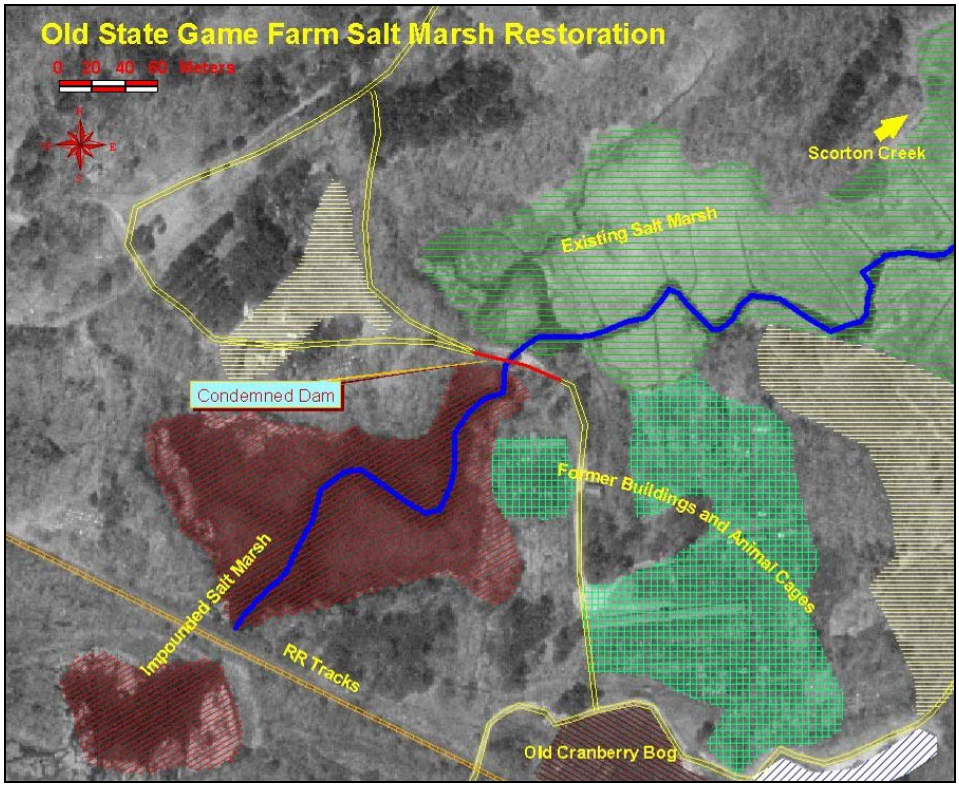


The project site is an impounded, former salt marsh along a small tributary stream of Scorton Creek. The impoundment was created by a causeway and roadbed built by the game farm around 1950. A second smaller impoundment also exists upstream, created by a railroad right-of-way. A culvert with a one-way flapper-type tide gate was used to allow freshwater to drain from the pond while keeping tidal water out. During a storm in 1991, the tide gate broke off, allowing freshwater to drain from the impoundment and some tidal water to flow in. Since then, this limited tidal flow has resulted in the inadvertent restoration of lost salt marsh functions and has reduced

stands of *Phragmites* which had become established in the impoundment. In the meantime, the Thornton Burgess Society became concerned about the integrity of the earthen dam and concrete culvert. After an inspection of the site by Mass. Department of Environmental Management's Office of Dam Safety, the dam was condemned and complete removal was recommended over any attempts to repair the structure. Given the current land stewardship goals for the site, maintaining the impoundment is no longer necessary and the Society is seeking guidance and resources to restore full tidal flow to the degraded salt marsh.

Goal of Project: The project's goal is to restore full tidal flow to the impounded salt marsh upstream of the condemned dam. The total size of the potentially restorable area is approximately eight acres, including the smaller impoundment upstream of the railroad bed.

Project Description: The main focus of the project will be to increase tidal flow into, and facilitate freshwater drainage from, the impoundment. This could be achieved by either replacing the culvert with a larger one without a tide gate or completely removing the earthen dam and restoring an open channel between the degraded salt marsh and the existing salt marsh downstream. Restoring an open channel would permanently preclude vehicular crossing of the stream, but would also be the simplest, cheapest, and most environmentally beneficial option. The Thornton Burgess Society favors this option and can comfortably use alternative routes for vehicular access to portions of the property across the creek. However, a small bridge, sized for pedestrian and light equipment traffic would be required. Realization of the open channel option is contingent on the concurrence of Mass. Fish and Wildlife, which is pending.



Status of Project: Preliminary studies contributing toward feasibility analysis underway in late summer, 2002.

Project Time Table: There is a realistic opportunity to compile feasibility analysis by end of 2002. Project design and permitting could occur during winter/spring 2003. Construction during 2003, pending funding availability.

Immediate Needs: Land survey, tidal hydrology data, develop monitoring plan.

Long-term Needs: Design and permitting services, construction materials and services.

Other Considerations:

- If open channel/bridge option pursued, Thornton Burgess Society volunteers have skills and experience to construct a small bridge.
- No buildings, structures, or roads exist nearby; only cause for concern from restored tidal flow would be railroad embankment and its culvert.
- Site is officially closed to the public, no issues regarding maintaining access during construction.

Impounded Marsh Upstream from Dam

Downstream Side of Culvert